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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,944	09/05/2003	Hyuk Bin Kwon	11037-130-999	1946

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EXAMINER	
LE, DAVID D	

ART UNIT	PAPER NUMBER
3681	

DATE MAILED: 01/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/656,944	KWON ET AL.	
	Examiner	Art Unit	
	David D. Le	3681	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) *16-41* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,10-13 and 42-44* is/are rejected.

7)☒ Claim(s) *7-9,14 and 15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This is the first Office action on the merits of Application No. 10/656,944, filed on 05 September 2003. Claims 1-44 are pending.

Documents

2. The following documents have been received and filed as part of the patent application:

- Foreign Priority Documents, received on 09/05/03

Election/Restrictions

3. Applicant's election without traverse of Species A, claims 1-15 and 42-44, in the reply filed on 08 December 2004 is acknowledged. Accordingly, claims 16-41 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Species.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-6, 10-11, 13, and 42-44 are rejected under 35 U.S.C. 102(b) as being anticipated by U. S. Patent No. 5,454,763 to Ikebuchi et al.

Claims 1-6, 10-11, 13, and 42-44:

Ikebuchi (Figs. 1-8; column 2, line 38 – column 21, line 60) discloses an automatic transmission shift control method and apparatus for a vehicle comprising:

- A primary shift portion (Fig. 1, being the first gear change mechanism);
- A secondary shift portion (Fig. 1, being the second gear change mechanism);
- An electronic control unit (62);
- The method includes the steps of:

(a) Starting shift control for the secondary shift portion by determining control start timing for friction elements of the primary and secondary shift portions based on vehicle operating conditions, if a shift signal is output, at the point of the output of the shift signal, and if shift control for the secondary shift portion is detected, starting shift control for the primary shift portion, and then determining a primary shift portion target change rate for feedback control of the primary shift portion and a secondary shift portion target change rate for feedback control of the secondary shift portion (i.e., column 15, lines 4-59);

(b) Performing feedback control of the primary shift portion according to a change rate of a difference between an input speed and an output speed of the primary shift portion and the primary shift portion target change rate, and the feedback control of the secondary shift portion according to a

change rate of a turbine speed and the secondary shift portion target change rate (i.e., column 3, lines 54-60; column 15, lines 4-19);

(c) Completing a shift of the primary shift portion, then completing a shift of the secondary shift portion (i.e., column 15, line 4 – column 16, line 56);

- Wherein the step (a) further comprises:
    - Determining control start timing of each solenoid valve of the primary and secondary shift portions based on hydraulic pressure exhaust time and initial fill time at the point of the output of the shift signal;
    - Outputting a shift start duty for the secondary shift portion according to the determined control start timing;
    - Determining the secondary shift portion target change rate for the secondary shift portion feedback control, if it is determined that shift control is performed in the secondary shift portion by the output of the shift start duty for the secondary shift portion;
    - Outputting a shift start duty for the primary shift portion, if it is determined that the shift control of the secondary shift portion has been started; and

- Determined the primary shift portion target change rate for the primary shift portion feedback control, if it is determined that the shift control is performed in the primary shift portion by the output of the shift start duty for the primary shift portion; (i.e., column 15, lines 20-59)

- Wherein the step (b) further comprises:
  - Respectively outputting an initial shift duty for the primary shift portion and an initial shift duty for the secondary shift portion;
  - Performing the primary shift portion feedback control by determining a primary shift portion calibration duty ratio based on a difference between the change rate of the difference of the input speed and the output speed of the primary shift portion and the determined primary shift portion target change rate, and then by outputting a primary shift portion control duty ratio according to the determined primary shift portion calibration duty ratio; and
  - Performing, while the feedback control for the primary shift portion is performed, the secondary shift portion feedback control by determining a secondary shift portion calibration duty ratio based on a difference between the turbine speed and

the determined secondary shift portion target change rate, and then by outputting a secondary shift portion control duty ratio according to the determined secondary shift portion calibration duty ratio; (i.e., column 17, lines 18-36)

- Wherein the step (c) further comprises:
  - Estimating a first time period to completion of a shift of the primary shift portion and a second time period to completion of a shift of the secondary shift portion, and then determining whether the first time period is less than the second time period;
  - Determining whether a shift of the primary shift portion has been completed, if it is determined that the first time period is less the second time period;
  - Returning to the step (b), if it is determined that the shift of the primary shift portion has not been completed;
  - Determining whether a shift of the secondary shift portion has been completed, if it is determined that the shift of the primary shift portion has been completed;
  - Returning to the step (b), if it is determined that the shift of the secondary shift portion has not been completed; and

- Completing the shift control, if it is determined that the shift of the secondary shift portion has been completed; (i.e., column 15, line 60 – column 16, line 9)

- Wherein if it is determined that the first time period is not less than the second time period, the primary shift portion target change rate is reset to such a value that a time period to completion of the shift of the primary shift portion becomes less than a time period to completion of the shift of the secondary shift portion, and the control process returns to the step (b); (i.e., column 15, lines 60-67)

- Wherein the shift signal is an upshift signal in a power-on state, and the step (b) further includes:
  - Setting the duty ratio of the on-coming friction element solenoid of the secondary shift portion as an initial duty ratio, and setting the duty ratio of the off-going friction element solenoid of the primary as an initial duty ratio;
  - Performing feedback control of the duty ratio of the off-going friction element solenoid of the primary shift portion, and simultaneously performing feedback control of the duty ratio of the on-coming friction element solenoid of the secondary shift portion; and

- Performing an initial fill for an on-coming friction element of the primary shift portion; (i.e., column 17, lines 18-36)

- Wherein the initial duty ratio of the on-coming friction element solenoid of the secondary shift portion is determined based on an input torque drop caused by a shift start of the primary shift portion (i.e., column 17, line 37 – column 19, line 57); and

- Wherein start timing of the initial fill for the on-coming friction element of the primary shift portion is determined such that a completion point of the initial fill coincides with an estimated synchronization timing (i.e., column 17, line 37 – column 19, line 57).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikebuchi et al. in view of U. S. Patent No. 5,882,276 to Usuki et al.

Claim 12:

Ikebuchi discloses limitations as set forth above. Regarding claim 12, Ikebuchi lacks wherein the initial duty ratio of the off-going friction element solenoid of the primary shift portion is determined based on learning of a calibration value according to a difference between a target input speed change rate and a real input speed change rate.

Usuki (Fig. 17; column 13, line 19 – column 15, line 59), on the other hand, teaches the learning correction of the initial duty ratio according to a difference between a target input speed change rate and a real input speed change rate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ikebuchi to include the learning correction, in view of Usuki, in order to effectively alleviate shift shock during shifting process.

Allowable Subject Matter

8. Claims 7-9 and 14-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Sakamoto et al. (U. S. Patent Application Publication No. US 2003/0027679 A1) teaches a vehicle shift control device and control method as shown in Figs. 1-9.
- Otsubo et al. (U. S. Patent No. 5,168,776) teaches a shift control system and method for automatic transmission as shown in Fig. 6.
- Shimada et al. (U. S. Patent No. 5,853,349) teaches a shift control method for automatic transmission as shown in Figs. 1 and 12-13.
- Kim (U. S. Patent No. 6,723,022) teaches a device and a method for shift controlling of an automatic transmission as shown in Figs. 1-2.
- Schulz et al. (U. S. Patent No. 5,809,442) teaches a multiple ratio transmission having swap-shift controls with optimum ratio upshifts as shown in Figs. 1-3.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David D. Le whose telephone number is 703-305-3690 or 571-272-7092. The examiner can normally be reached on Mon-Fri (0700-1530).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles A Marmor can be reached on 703-308-0830 or 571-273-7095. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ddl

Charles A Marmor 1/19/05

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